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THE APOIDEA (HYMENOPTERA) OF THE TISZA-DAM

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Abstract

I collected 72 species from the Tisza-dam, in 1973—1974. At Tiszasziget, *Eucera nigrifacies* LEP. counts among rare species, while at Körtvélyes, the species *Halictus fulvipes* KLUG., *Osmia tridentata* DUF. et PERR., *Epeolus tristis* SCHMIDT., *Camtopoeum Friesei* MOCS., *Bombus argillaceus* SCOP. In the biotope investigated, the dominance of the species Halictus proved to be the greatest.

Introduction

The Tisza-dam (in rather dry years: the flood area) and the ruderal areas of smaller or larger breadth bordering it from the external side provide good feeding and nesting possibilities for the superfamily Apoidea (order Hymenoptera). The pollination of the most important papilionaceous fodder-plants (lucerne, red-clover) is carried out prevailingly by the Apoidea. In the course of my investigations my aim was to establish the Apoidea fauna, dominance conditions of the dam sectors at Mártély, Körtvélyes, Tiszasziget. I performed regular flower-visiting observations and analysed when the single meadow-plants, weeds, possibly cultivated plants mean pollen and nectar source, and for which Apoidea species.

Investigation areas and method

I carried on observations and collections in the sectors Mártély-Körtvélyes (between river-km 200—206) and Tiszasziget (river-km 155—156.5) (Fig. 1), in the flood area, on the dam, and in the zone bordering the dams. I carried out investigations at Mártély-Körtvélyes between June 18 and September 4, 1974, on ten occasions, at Tiszasziget between May 15 and September 11, 1973 on four occasions, May 17 and September 19, 1974, on six occasions, altogether on twenty occasions. From June 17, 1974 on, owing to the long-lasting high-water of the Tisza, I could carry out collections only on the dam and its weed ecotone. During collecting I was complying with the aspects of flowering. Going on evenly in the sectors investigated. I collected the Apoidea from the flower-level of meadow, plants and weeds. For establishing their species composition, I performed two-times-two-hour time-collections with butterfly-net, between 9 to 15 o' clock on the investigation-days. Except Apis mellifera L., I could collect every Apoidea specimen.

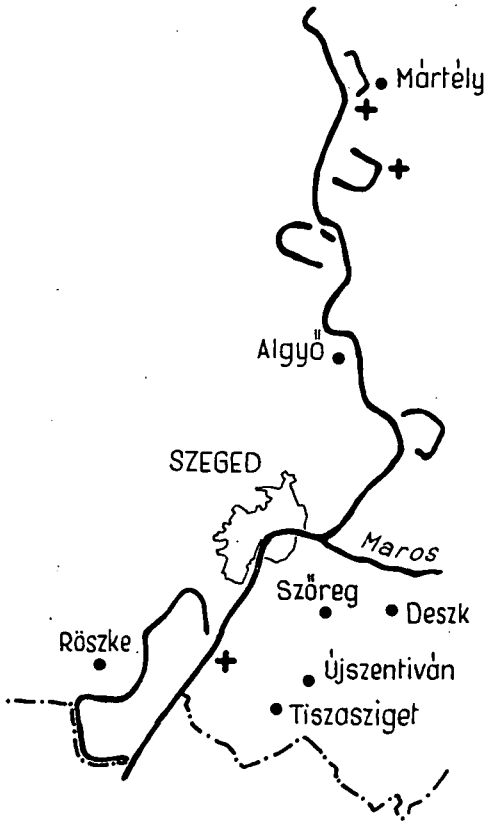

Fig. 1. Map of collecting sites.

Results

Fauna evaluation

In 1974 at Mártély 12, at Körvélyes 56 while in 1973—1974 at Tiszasziget 39, in the course of the investigations altogether 72 species were collected(Table 1). The honeybee occurs in all the three biotopes but I have not collected it. Analysing the list of species, the considerable species-representation of the genera Halictidae, Megachilidae, Eucera, and Bombuses is remarkable. Some species of the Halictus, Megachile, and Eucera genera showed to be considerable pollinators of lucerne (MÓCZÁR 1961b) and Bombuses first of all those of red clover in Hungary (BENEDEK 1970). The species-number of genus *Andrena* (Andrenidae) is strinkingly small. According to M. MÓCZÁR, in national relation (1957, 1958, 1960, 1967), *Prosopis cornuta* SM., *Halictus morbillosus* KRIECHB., *Megachile leucomalla* GERST. are rare species, and *Halictus fulvipes* KLUG., *Osmia tridentata* DUF. et PERR., *Eucera nigrifacies* LEP., *Epeolus tristis* SMITH., *Bombus argillaceus* SCOP. are very rare ones. In the course of my regular collections in the county Csongrád, I have learned in case of *Halictus morbillosus* KRIECHB. that it was found at several collecting sites, with a compara-

Table 1. *List of collected Apoidea species by collecting sites and sexes*

Species	Tisza-sziget		Körtvélyes		Mártély	
	♀	♂	♀	♂	♀	♂
Prosopis euryscapa FÖRST.			+	+		
P. cornuta Sm.			+			
Andrena carbonaria L.	+					
A. flavipes PZ.	+	+	+	+	+	
A. labialis K.	+	+	+	+		
A. limata Sm.	+	+				
A. ovatula K.	+	+	+		+	
Camptopoeum Friesei MOCS.				+		
C. frontale F.				+		
Melitta leporina PZ.	+	+		+	+	+
M. tricincta K.			+			
Systropha curvicornis SCOP.	+		+			
S. planidens GIR.	+					
Dasypoda plumipes PZ.			+			
Halictus 4-cinctus F.	+	+	+	+	+	
H. 6-cinctus F.			+	+		
H. fulvipes KLUG.			+	+		
H. eurygnathus BLÜTHG.	+		+		+	
H. laticeps SCHCK.	+					
H. morbillosus KRIECHB.	+	+	+	+		
H. Kessleri BRAMS.			+			
H. maculatus SM.			+			
H. malachurus K.	+	+	+	+	+	
H. marginatus BR	+		+			
H. nigripes LEP.		+	+	+		
H. simplex BLÜTHG.		+				
H. intermedius SCHCK.			+			
H. politus SCHCK.			+			
H. veneticus EBMER	+		+			
Megachile argentata F.	+		+	+	+	
M. centuncularis L.			+	+	+	
M. ericetorum LEP.			+	+		
M. pilidens ALFK.			+			
M. rotundata F.			+		+	+
M. Willoughbiella K.			+	+	+	
M. leucomalla GERST.			+			
Osmia acuticornis DUF. & PERR.	+					
O. atrocoerulea SCHILL.			+			
O. aurulenta PZ.	+		+			
O. spinulosa K.			+			
O. tridentata DUF. & PERR.			+			
Anthidium oblongatum LATR.			+			
Tetralonia macroglossa f. xanthopyga ALFK.			+			
T. armeniaca MOR	+	+	+			
T. salicariae LEP.		+	+			
T. scabiosae MOCS.					+	+
Eucera clypeata EV.		+	+	+		
E. interrupta BAER			+	+		
E. longicornis L.	+					
E. nigrifacies LEP.	+	+				
E. nitidiventris MOCS.	+	+				
E. pollinosa SMITH.		+	+			
E. seminuda BR.		+	+			
E. tuberculata F.	+	+				
Anthophora acervorum var. Sgualens DOURS	+	+				

A. crinipes SMITH.			+			
A. parietina F.			+			
Epeolus tristis SMITH.						+
Xylocopa violacea L.					+	
Ceratina cyanea K.					+	
Bombus argillaceus SCOP.						+
B. derhamellus K.	+	+			+	
B. helferanus SEIDL.					+	
B. hortorum L.					+	
B. agrorum F.					+	
B. muscorum F.	+					
B. lapidarius L.	+	+				
B. terrestris L.	+	+			+	+
B. silvarum distinctus VOGT.	+	+		+	+	
Psithyrus barbutellus K.	+					
P. rupestris F.		+				+
P. vestalis GEOFFR. & FOURCR.						+

tively high individual number, while in case of the other species mentioned the result of my collections is supporting M. Móczár's opinion. At Mártély the endemic species *Tetralonia scabiosae* MOCS. was collected. A o* specimen of the thermophilous species (PITTIONI—SCHMIDT 1943) *Camptopoeum friesei* MOCS. was found at Körtvélyes, having in an irregular way three cubital cells in the first pair of wings. In the Zoological Department of the Museum of Natural Sciences I haven't found any similar specimen in the course of comparison.

Table 2. *Dominancy values of the Apoidea species*

Species	Tiszasziget		Körtvélyes		Mártély		Sum	
	ind.	p. c.	ind.	p. c.	ind.	p. c.	ind.	p. c.
Halictus eurygnathus BLÜTHG.	46	25,55	26	9,12	6	12,50	78	15,20
Halictus malachurus K.	4	2,22	42	14,74	10	20,84	56	10,92
Bombus lapidarius L.	17	9,44	11	3,86	—	—	28	5,46
Tetralonia salicariae LEP.	1	0,55	21	7,37	—	—	22	4,29
Halictus fulvipes KLUG.	—	—	15	5,26	—	—	15	2,92
Halictus nigripes LEP.	2	1,10	13	4,56	—	—	15	2,92
Eucera tuberculata F.	12	6,65	—	—	—	—	12	2,34
Halictus marginatus BL.	1	0,55	9	3,16	—	—	10	1,95
Andrena limata SM.	11	6,11	—	—	—	—	11	2,15
Tetralonia scabiosae MOCS.	—	—	—	—	7	14,58	7	1,36
Other species	86	47,83	148	51,93	25	52,08	259	50,49

Dominance relations

On the basis of the results (Table 2), the species and individual numbers of the genus *Halictus* were the most considerable. In the sector investigated of the Tiszadam, the dominance of *Halictus eurygnathus* BLÜTHG. (15.2 p. c.) and *Halictus*

malachurus K. (10,92 p. c.) proved to be the most considerable. From among the Halictidae, the lucerne is visited resp. pollinated by *Halictus eurygnathus* BLÜTHG. with the most considerable individual number in national relation (MÓCZÁR 1961a). In the county Csongrád, apart from the above-mentioned *Halictus eurygnathus* BLÜTHG., *H. malachurus* K. is one of the main visiting wild bees of the lucerne fields of hard soil. (TANÁCS 1975). The species *Tetralonia* and *Eucera* were collected in comparatively large species and individual numbers. From the species *Bombus*, the dominance of *Bombus lapidarius* L. was the most considerable (5.46 p. c.). Their flower-visiting activity and flying distance are large, they display therefore a serious activity in pollinating the papilionaceous agricultures lying close to the dam. From the Andrenidae only the dominance of *Andrena limata* SM. was considerable. It is remarkable that the dominance of wild bees, as *Andrena ovatula* K., *A. labialis* K., *A. flavipes* PZ,, that are so frequent in our fauna-area, proved very small.

Summing up the results, it may be established that, in the course of the collections carried on at the Tisza-dams, the dominance of several economically important species, as the species *Halictus eurygnathus* BLÜTHG., *Halictus malachurus* K., *Bombus lapidarius* L., and that of the species *Eucera* and *Tetralonia*, was high.

Flower-visiting activity of the Apoidea

On the Tisza-dams, BODROGKÖZY (1966) distinguished three plant associations. At both sides of the dam-crown, the weed-association *Schlerechloo — Polygonetum avicularis*, on the dam-slopes *Cynodonti-Poëtum angustifoliae alopecuretosum*, while on the dam-feet the *Agrosti — alopecuretum poëtosum angustifoliae*, including several weedplants, are forming the plant-associations of the dam. The components of the stand of phytocoenoses are, to a smaller or larger extent, the phanerogamous weeds, meadow-plants and (sporadically) the cultivated plants. According to my observations at Tiszasziget in 1973—1974, in April, the Anthophora, mainly the male Eucera individuals, *Bombus derhamellus* K., *Andrena limata* Sm. visited the flowers of *Symphitum officinale* L., *Lamium purpureum* L., and *Glechoma hederacea* L., flowering at the feet of dams, towards the flood area. The flowers of *Taraxacum officinale* L. were visited by the first generation of the bivoltinous genus *Andrena* and *Halictus*. *Salvia nemorosa* L. and *Brassica napus* L. are flowering in large numbers from the second half of May, visited by the species of the genera *Eucera* and *Osmia*. In June, the main nectar-source of the Apoidea is the papilionaceous meadow-plants and weeds. *Lathyrus tuberosus* L. is first of all the main food plant of *Eucera*, while *Lotus corniculatus* L. that of Megachilidae. Summing up the flower-visiting results, it is to be established that the other species of the Apoidea swarming in June sporadically visit the flowers of the species *Vicia, Trifolium, Coronilla varia* L., *Consolida regalis* GRAY., *Echium vulgare* L., *Lathyrus tuberosus* L., *Lotus corniculatus* L. From the flower of *Convolvulus arvensis* L. I. have collected the species of genera *Systropha* and *Camtopoeum*. From the middle of the Summer, the flowers of the plant family Compositae, first of all those of *Carduus acanthoides* L. were visited by large numbers of Halictidae. I have collected the individuals of *Halictus eurygnathus* BLÜTHG., *H. malachurus* K., *H. 4-cinctus* F., *H. marginatus* BR., *H. morbillosus* KRIECHB., *H. nigripes* LEP., *H. 6-cinctus* F., *H. fulvipes* KLUG., mostly from the flowers of *Carduus acanthoides* L. In the second half of August, after the *Carduuses* ceasing flowering in large numbers, the flowers of *Centaurea pannonica* HEUFF., *Inula britannica* L., *Cicorium intybus* L., still flowering, are visited by the wild bees. At Körtvélyes, I

have collected the individuals of *Tetralonia salicariae* LEP. from the flowers of *Althaea officinalis* L. and *Lythrum salicaria* L., found frequently in the burrows dried near the dam. At Körtvélyes, the individuals of *Tetralonia scabiosae* MOCS. occurred on the flowers of *Dipsacus silvestris* HUDO. The flower-visiting distance of Bombuses is long. The Andrenidae, with the exception of *Andrena limata* SM., can only be found comparatively rarely and with low species number on the flowers of dams. At Mártély and Tiszasziget, in a lucerne field lying directly close to the dam, in the time of its flowering, I did not collect any Andrenidae, except one *Andrena flavipes* PZ. It is probable that *A. ovatula* K., *A. labilais* K. visited the flowers of the near-by lucerne field. In September, the Apoidea visited the flowers of *Lythrum salicaria* L., *Cichorium intybus* L., and of the *Melilotus officinalis* L. occurring sporadically, and all flowering still.

As analysing the results, it may be established that during the flying-time of the Apoidea, a continuous pollen and nectar source is provided for them by the miscellaneous meadow and weed flora of the dam. That is important first of all at the end of June and in the first part of July when a periodical lack of nourishment occurs and, in case of the species *Eucera* and *Tetralonia*, that has a strong influence upon the nesting and offspring-educating activity of females (BENEDEK 1972).

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